State and Future of Hair in Feature Film and Visual Effects

Rob Vogt
DreamWorks Animation
rob.vogt@dreamworks.com

Steve Marschner
Cornell University
srm@cs.cornell.edu

Hayley Iben
Pixar Animation Studios
iben@pixar.com

Sean Palmer
Walt Disney Animation Studios
sean.palmer@disneyanimation.com

Colin Doncaster
Peregrine Labs
colin@peregrinelabs.com

Oba Ameziane-Hassani
Digital Domain
obafkps@gmail.com

Damon Crowe
DreamWorks Animation
damon.crowe@dreamworks.com

Gaelle Morand
Industrial Light and Magic
gmorand@ilm.com

Figure 1: Moana 2017, courtesy of Disney Animation Studios

ABSTRACT

Computer generated hair has historically been a challenging element in the feature film and visual effects industry. Technology and workflow challenges in authoring, animation, simulation, shading, lighting and rendering have motivated studios and software companies to invest in tools and techniques to address the ever-growing creative appetite for hair to deliver captivating stylized and/or realistic characters.

To deliver on the creative demand, some feature production studios have specialized hair production across multiple workflows-visual development, rigging, simulation, and lighting to name a few. Has this divided approach to solving a visually holistic challenge affected the tools choices and the way we invest in our toolsets?

This panel will bring together engineers and artists representing various areas of expertise to provide a summary of their day to day relationship with hair. They will describe some of the big challenges and their solutions, as well as any issues still outstanding. From there we will dive into some of the commonalities and outliers to better understand how we have arrived at our current state and ultimately what the future is for CG hair, from a technology, workflow, and organizational points of view.

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CCS CONCEPTS

• **General and reference** → *Evaluation*; • **Computing methodologies** → *Modeling methodologies*; *Physical simulation*; *Rendering*;

KEYWORDS

hair, groom, render, simulation, workflows, pipeline

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SPECIFIC QUESTIONS

What are the challenges writing general use tools for hair authoring?

Are there differences between photoreal and stylized hair from a tool perspective?

Why are some of the larger/more established studios hesitant or slow to adopt commercial hair authoring software?

What techniques are used to ensure a groom preserves the intent of the approved look while simulated?

What are the challenges in getting hair to work across a studio pipeline? And how are these resolved?

How closely should we model the actual physics of hair interaction with light, and why is it harder to achieve good results with some kinds of hair?

What is the desire / appetite for the upper bound on the number of hairs to simulate? Should we strive to simulate all of the follicles in a head of hair?

How can we best visualize final hair density, while still providing a fast interactive workflow for the artist?

REFERENCES

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